DATA MODUL
DISPLAYS AND EMBEDDED SOLUTIONS

User Manual

MIO-5270

Version August 2012

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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Warnings, Cautions and Notes

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*

Caution! *Cautions are included to help you avoid damaging hardware or losing data. e.g.*

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! *Notes provide optional additional information.*

Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advantech.com

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- 1 x MIO-5270 SBC
- 1 x SATA Cable 30cm (P/N 1700006291)
- 1 x SATA Power Cable 35cm (P/N 1700018785)
- 1 x Audio Cable 20cm (P/N 1700019584)
- 2 x COM Cable 22cm (P/N 1701200220)
- 1 x COM RS-422/485 Cable 25cm (P/N 1700019435)
- 1 x Heatsink (25mm) for T40E/T40R (P/N 1960053507N001)
- 1 x Cooler (25mm) for T56N (P/N 1960053508N001)
- Startup Manual
- CD-ROM (Manual, Driver, Utility)
- 1 x Mini Jumper(10pcs package) (P/N 9689000002)

Ordering Information

Model Number	Description
MIO-5270D-S6A1E	AMD T56N 1.65G Dual Core + HudsonM1
MIO-5270D-S0A1E	AMD T40E 1.0G Dual Core + HudsonM1
MIO-5270S-S0A1E	AMD T40R 1.0G Single Core + HudsonM1

	MIO-5270S-S0A1E	MIO-5270D-S0A1E	MIO-5270D-S6A1E
CPU	AMD T40R 1.0G SC	AMD T40E 1.0G DC	AMD T56N 1.65G DC
L2 Cache	512 KB L2	512 KB L2	1 MB L2
LVDS	48-bit	48-bit	48-bit
VGA	Yes	Yes	Yes
HDMI	Yes	Yes	Yes
GbE	2	2	2
Audio	Yes	Yes	Yes
RS-232/422/485	1	1	1
RS-232	3	3	3
USB 2.0	6	6	6
GPIO	8-bit	8-bit	8-bit
SATAII	2	2	2
Cfast	1	1	1
PCIe Mini Card*	1	1	1
MIOe	Yes	Yes	Yes
Thermal Solution	Passive	Passive	Active
Operational Temp.	0 ~ 60° C	0 ~ 60° C	0 ~ 60° C
* mSATA is optional alternative by request			

Optional MIOe Module

Part Number	Description
MIOe-210-D6A1E	4x RS232/422/485 2x RS422/485 with DSUB connector, 8-bit GPIO
MIOe-210-W6A1E	4x RS232/422/485 2x RS422/485 with Wafer connector, 8-bit GPIO
MIOe-220-L3A1E	3 x GbE with RJ45 connector
MIOe-220-B3A1E	3 x GbE with RJ45 connector through PCIE switch
MIOe-230-L0A1E*	Displayport to 48-bit LVDS
MIOe-230-D0A1E*	Displayport to Ext. Displayport

*MIOe-230 compatibility is optional by request.

Optional Accessories

Part number	Description
1960054266T001	Heat spreader AMD-Ontario 137x84.2x16.7-SC MIO-5270
1703100260	Internal USB 5/6 cable
1935032000	Screw of Heatsink / Cooler R/S 5.5 2.0 +M M3*20L ST Ni
1910002088	The POST Stand off, F=M3*6L M=M3*5L B=5 H=16 Ni
1757003082	Adapter 100-240V 60W 12V 5A W/O PFC

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If one of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well, or you cannot get it to work according to the user's manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

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Chapter 1

General Information

1.1 Introduction

- CPU: AMD G-series eOntario
  - T56N (Dual Core 1.65GHz) on MIO-5270D-S6A1E
  - T40E (Dual Core 1.0GHz) on MIO-5270D-S0A1E
  - T40R (Single Core 1.0GHz) on MIO-5270S-S0A1E
- MIO Compact SBC form factor standard
- One 204-pin SODIMM DDR3 up to 4G
  - T56N: DDR3 1333 MHz
  - T40E/T40R: DDR3 1066 MHz
- Dual Independent Display: VGA+LVDS, VGA+HDMI, HDMI+LVDS
- 6 x USB 2.0 ports
- 2 x SATAII (Max data transfer rate 300 MB/s)
- 4 x COM (3 x RS-232, 1 x RS-232/422/485)
- Multi level Watchdog timer (set by Advantech iManager)
- 2 x GbE
- MIOe 2.0 connector
- Wake-on-LAN, Wake-on-Modem

1.2 Product Specifications

General

CPU	AMD G-Series: T56N (Dual Core 1.65GHz) on MIO-5270D-S6A1E T40E (Dual Core 1.0GHz) on MIO-5270D-S0A1E T40R (Single Core 1.0GHz) on MIO-5270S-S0A1E
L2 Cache	T56N: 1MB T40E/T40R: 512KB
System Chipset	AMD G-series + A50M FCH
BIOS	AMI EFI 32-Mbit
System Memory	1 x 204-pin SODIMM socket DDR3 up to 4GB: T56N up to DDR3 1333 MHz T40E/T40R up to DDR3 1066 MHz
Power Management	APM1.2, ACPI support
SSD	mSATA*, CFast
Watchdog Timer	255 levels timer interval, programmable by software. Multi level WDT (set by iManager)
Expansion Interface	PCIe Mini Card, CFast, MIOe
Battery	Lithium 3 V / 210 mAH
*mSATA is optional alternative by request.	

I/O

Internal I/O Interface	2 x SATAII, 3 x RS-232, 1 x RS232/422/485, 2 x USB 2.0, GPIO, SMBus
Rear I/O	4 x USB 2.0, HDMI, VGA, 2 x RJ45 Ethernet, DC Power-in
Power Connector	T56N: 2 x 2 pin power connector T40E/T40R: DC Jack
SMBus	Supported
GPIO	8-bit general purpose input/output

Ethernet

Speed	GbE 10/100/1000 Mbps
Chipset	Realtek RTL8111E- VB-GR (GbE1, GbE2)
Ethernet Interface	Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
Connector:	RJ45 x2

Display

Controller	AMD G-series T56N/T40E/T40R
Resolution	VGA: – T56N: 2560 x 1600 – T40E/T40R: 1920 x 1200 LVDS: – LVDS supports single channel 24-bit/dual channels 48-bit – T56N: 2560 x 1600 @ 60 Hz – T40E/T40R: 1920 x 1200 @ 60 Hz – (Pixel clock rate 80MHz) HDMI: – Supports 1920 x 1080p @ 60 Hz, 36bpp – Supports HDMI 1.3, using TMDS data encoding
Dual Independent Display	VGA+LVDS, VGA+HDMI, HDMI+LVDS

1.3 Chipset

1.3.1 Functional Specifications

1.3.1.1 Processor: AMD G-series T56N/T40E/T40R

CPU Process	40nm
FSB	– T56N: DDR3 1333 MHz – T40E/T40R: DDR3 1066 MHz
Memory	SODIMM DDR3 up to 4G – T56N: DDR3 1333 MHz – T40E/T40R: DDR3 1066 MHz
VGA Memory	Up to 512MB of dynamic video memory allocation
Internal Graphics Features	■ DirectX® 11 graphics with UVD 3.0 ■ Up to 2 Display Port/TMDS ■ Integrated VGA DAC ■ Displayport 1.1a ■ Integrated Graphics ■ Engine clock speed: 500 MHz or 280 MHz, dependent on OPN ■ Dedicated graphics memory controller"

Video Accelerator	■ 2D Acceleration ■ 3D Acceleration – Fully DirectX® 11 compliant, including full speed 32-bit floating point per component operations – Support for OpenCL™ 1.0 – Support for OpenGL® 3.2 and 2.1 ■ Motion Video Acceleration – Supports DVD, Blu-ray*, and SDTV/HDTV content playback with the lowest CPU usage – H.264 implementation based on the ISO/IEC 14496-10 specification – VC-1 implementation based on the SMPTE 421M specification – MPEG2 implementation based on the IOS 13811-2 specification"
Display	■ VGA: T56N: 2560 x 1600 T40E/T40R: 1920 x 1200 ■ LVDS: LVDS supports single channel 24-bit/dual channels 48-bit T56N: 2560 x 1600 @ 60Hz T40E/T40R: 1920 x 1200 @ 60Hz (Pixel clock rate 80MHz) ■ HDMI: Supports 1920 x 1080p @ 60Hz, 36bpp Supports HDMI 1.3, using TMDS data encoding
Dual independent display	VGA+LVDS, VGA+HDMI, HDMI+LVDS

1.3.1.2 Chipset (Hudson M1)

South Bridge	
Control Hub	Hudson M1
RS-232	3
RS-232/422/485	1
K/B	1
Mouse	1
USB	6 x USB 2.0
Audio	HD Audio, ALC892 Codec, Line-in, Line-out, Mic-in, speaker out (R/L) (Supports 8Ω 1W or 4Ω 2 W Speaker for Speaker-out)
Other Features	* 6 x USB 2.0 ports, 480MB/s (all internal connectors) Default: 500mA @ one port (Up to 1A @ 2 ports) * 2 x SATAII (Max. Data transfer Rate 300MB/s) * HD Audio CODEC (ALC892) * Power Management (S0, S3,S4, S5)
BIOS	32-Mb Flash BIOS via SPI

1.3.1.3 iManager

iManager	
Sequence control	Supported
SMBus	Supported
GPIO	8-bit GPIO
Watchdog timer	Multi Level WDT (set by Advantech iManager) Programmable 1-255 sec / min
Hardware monitor	CPU Temperature / input Current / input Voltage
Power saving	Deep sleep S5 mode / Smart Fan / Back light control
FAN	1. Smart FAN Support. 2. Programmable automatic fan monitor based on temperature. 3. Reserve CPU FAN Power Connector x 1 Pin2: +12 V Pin3: Fan speed signal input
Board information	Running HR / Boot record

1.3.1.4 Others

Ethernet	
Chipset	GbE1: Realtek 8111E-VB-GR 10/100/1000 Mbps GbE2: Realtek 8111E-VB-GR 10/100/1000 Mbps
IEEE Compliant	Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
Disable LAN through BIOS	Yes
Driver Support	WES7/Windows XP/XP Embed/CE, Linux, QNX
Audio	
Codec	HD Audio, Realtek ALC892
Connector	Line in, Line out, Mic in, Speak out (R/L, 8 Ohm 1W/ 4Ohm 2W)
Voltage	3.3V, +5V, +12V, Vcore

1.3.2 Mechanical Specifications

1.3.2.1 Dimensions (mm)

146 x 102 mm (5.7 x 4 inches)

1.3.2.2 Board height on Top side (mm)

16,4mm (Rear I/O USB)

1.3.2.3 Board height on bottom side (mm)

8.5mm (CF socket)

1.3.2.4 Heatsink/Cooler Dimensions (mm)

137mm (L) x 87.2mm (W) x 25mm (H)

1.3.2.5 Board net weight without heatsink (g)

140 g

1.3.3 Electrical Specifications

1.3.3.1 Power Supply Voltage

- **Power Type**
  Single 12V DC power in
- **Power Supply Voltage**
  Single 12V ± 10%

1.3.3.2 Power Supply Current

Test Condition:

- Add-in Card - None
- PCIe Mini Card - None
- Memory - DDR3 SODIMM 4GB
- HDD - 3.5" WD 80GB SATA2 *1
- KeyBoard/Mouse - USB
- Display - VGA

Condition	Power Consumption (A or mA)						
	Voltage/ Condition	Power on - Boot Procedure	DOS Idle Mode	Win. Idle Mode	Win. HCT12 (10minutes)	S3	S5
MIO-5270D-S6A1E	+12V	1.65	1.45	0.65	1.35	0.03	0.05
MIO-5270D-S0A1E	+12V	0.92	0.89	0.53	0.82	0.03	0.05
MIO-5270S-S0A1E	+12V	0.92	0.83	0.59	0.8	0.02	0.04

1.3.3.3 RTC Battery

- **Typical Voltage:** 3.0 V
- **Normal discharge capacity:** 210 mAh

1.3.4 Environmental Specifications

1.3.4.1 Operating Temperature

- **Operating temperature:** 0 ~ 60°C (32~140°F)

1.3.4.2 Operating Humidity

- **Operating Humidity:** 0% ~ 90% Relative Humidity, non-condensing

1.3.4.3 Storage Temperature

Standard products (0~60°C)

- **Storage temperature:** -40~85°C

1.3.4.4 Storage Relative Temperature

Standard products (0~60°C)

- **Relative humidity:** 95% @ 60°C

Phoenix products (-20~80°C)

- **Relative humidity:** 95% @ 60°C

Platinum Phoenix products (-40~85°C)

- **Relative humidity:** 95% @ 60°C

Chapter 2

Hardware Installation

This chapter explains the setup procedures of the MIO-5270 A1 hardware, including instructions on setting jumpers and connecting peripherals, switches, indicators and mechanical drawings. Be sure to read all safety precautions before you begin the installation procedure.

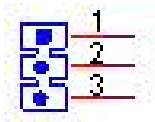
2.1 Jumpers

2.1.1 Jumper List

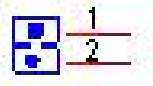
J1	Clear CMOS
J2	Auto Power On Setting
J3	LCD Power
J5	COM2 Setting

2.1.2 Jumper Settings

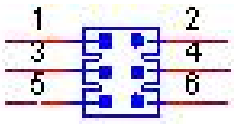
J1	**Clear CMOS**
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP 2000-13 WS
Setting	Function
(1-2)*	Normal
(2-3)	Clear COMS



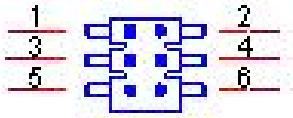
J2	**Auto Power On Setting**
Part Number	1653002101
Footprint	HD_2x1P_79_D
Description	PIN HEADER 2*1P 180D(M)SQUARE 2.0mm DIP W/O Pb
Setting	Function
NC	Power Button for Power On
(1-2)*	Auto Power On



J3	LCD Power
Part Number	1653003201
Footprint	HD_3x2P_79_D
Description	PIN HEADER 3*2P 180D(M) 2.0mm DIP SQUARE WO/Pb
Setting	Function
(1-3)*	+3.3V
(3-5)	+5V
(3-4)	+12V

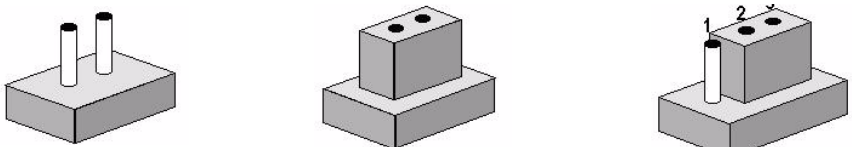


J5	COM2 Setting
Part Number	**1653003260**
Footprint	HD_3x2P_79
Description	PIN HEADER 3x2P 2.0mm 180D(M) SMD 21N22050
Setting	Function
(1-2)*	RS232
(3-4)	RS485
(5-6)	RS422

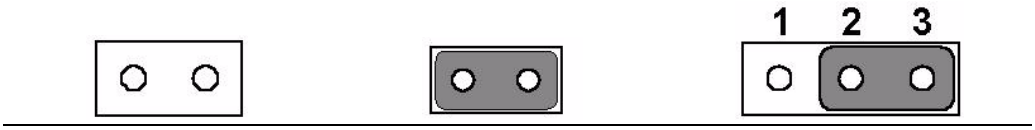


2.1.3 Jumper Description

Cards can be configured by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To close a jumper, you connect the pins with the clip. To open a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



The jumper settings are schematically depicted in this manual as follows.



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

Warning! *To avoid damaging the computer, always turn off the power supply before setting jumpers to clear CMOS. Before turning on the power supply, set the jumper back to 3.0 V Battery On.*

2.2 Connectors

2.2.1 Connector List

CN1	Power Switch
CN2	Inverter Power Output
CN3	Reset
CN4	SATA Power
CN5	SATA 1
CN6	SATA 2
CN7	RS422/485
CN8	GPIO
CN10	DDR3 SODIMM Socket
CN12	Internal USB
CN13	SMBus
CN14	RJ45 Ethernet x 2
CN17	48 bits LVDS Panel
CN18	External USB (1/2)
CN19	External USB (3/4)
CN20	HDMI
CN22	12V Power Input
CN23	VGA
CN24	Audio
CN25	COM1/COM2
CN26	COM3/COM4
CN28	MIOe
CN29	PCIE Mini Card Holder
CN30	PCIE Mini Card
CN31	CFast
FAN1	CPU FAN

2.3 Mechanical

2.3.1 Jumper and Connector Location

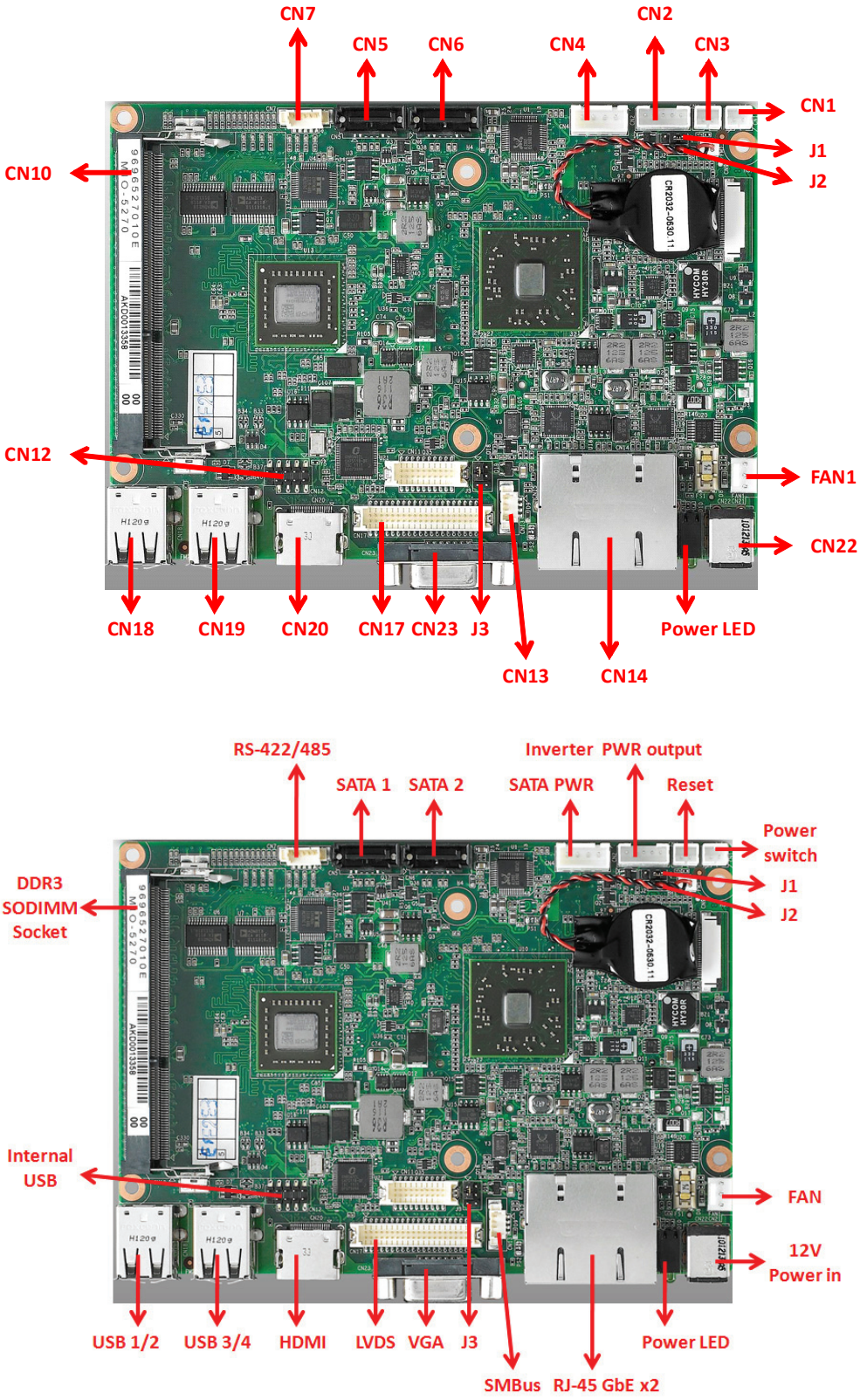


Figure 2.1 Jumper and Connector Layout (Component Side)

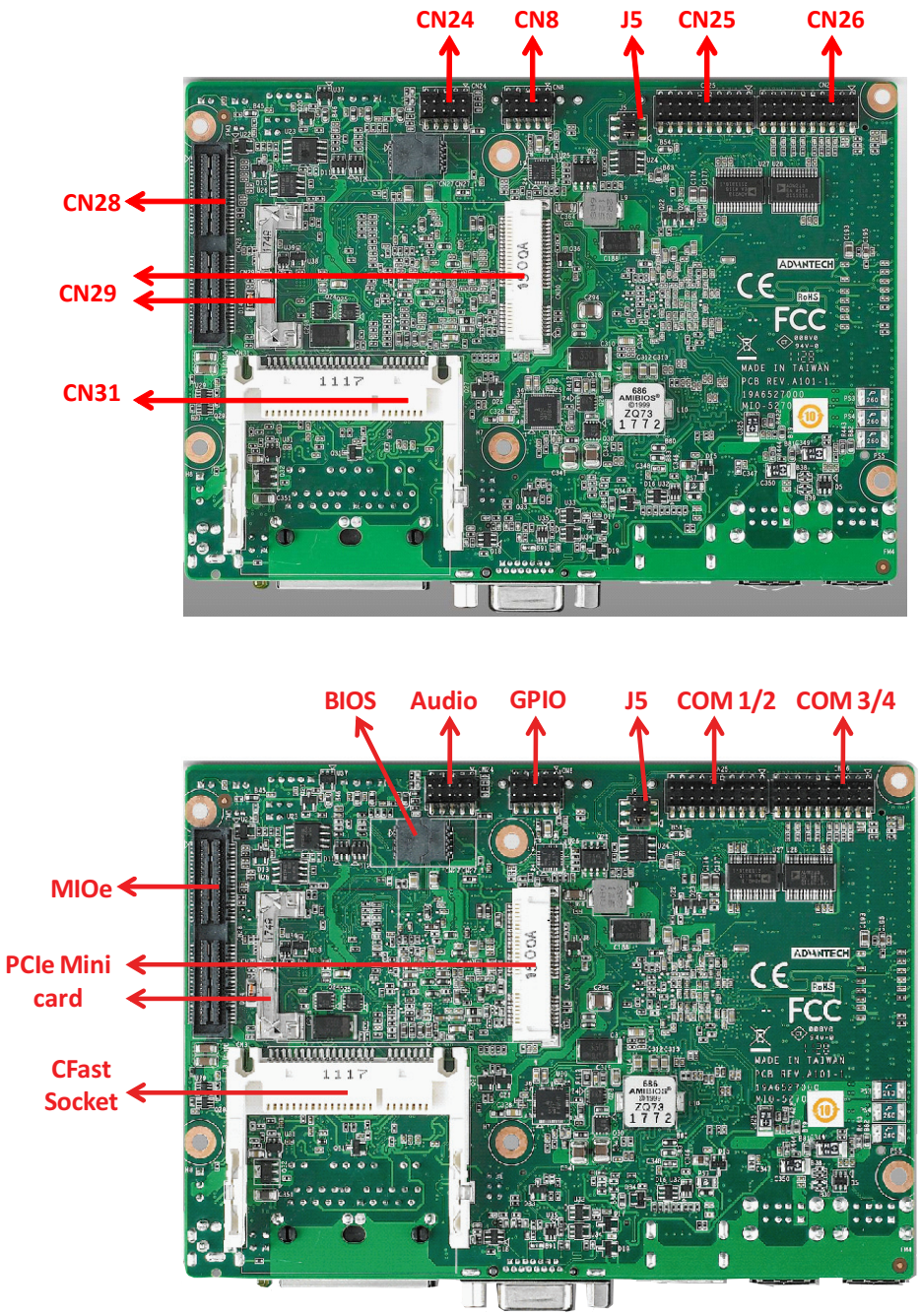


Figure 2.2 Jumper and Connector Layout (Solder Side)

2.3.2 Board Dimensions

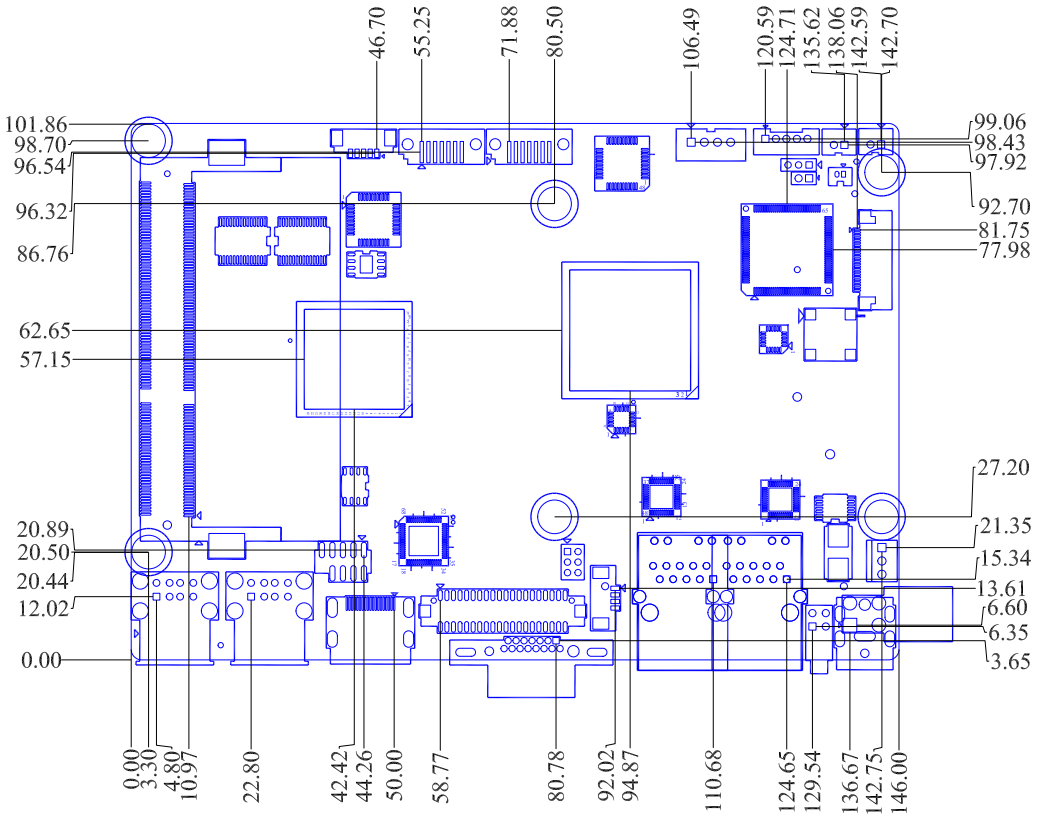


Figure 2.3 Board Dimension Layout (Component Side)

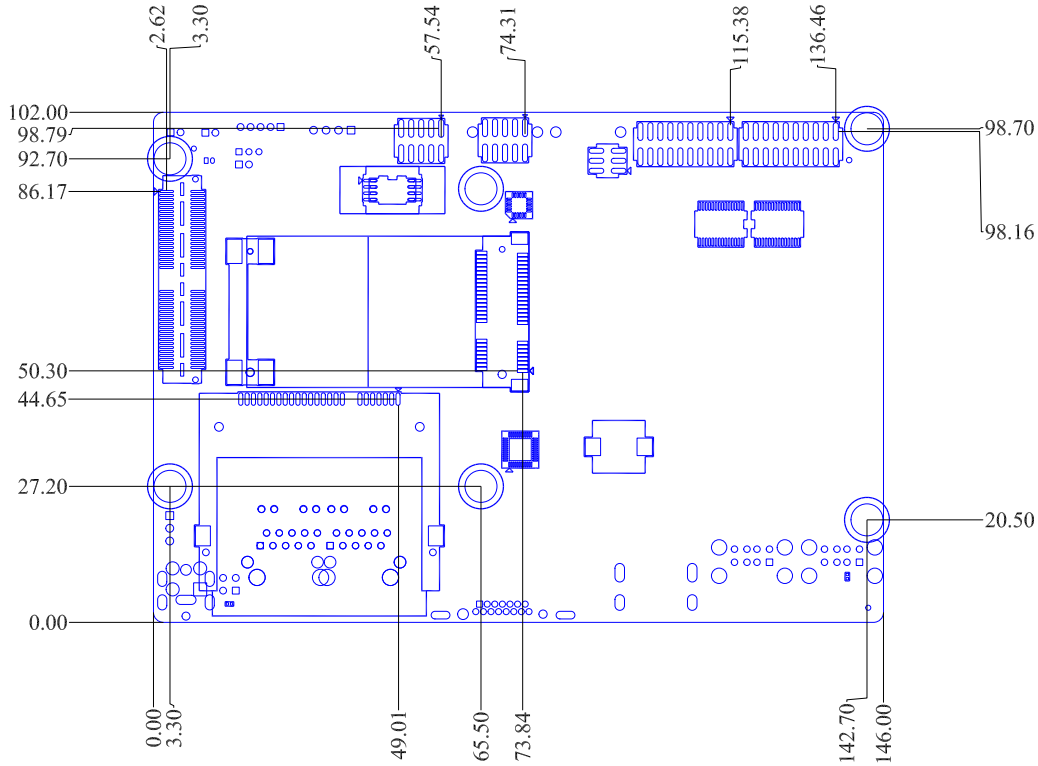


Figure 2.4 Board Dimension Layout (Solder Side)

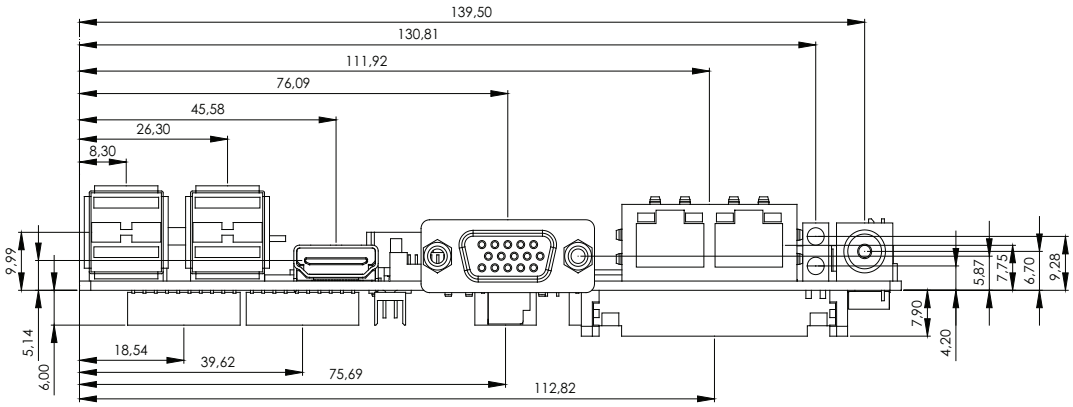


Figure 2.5 I/O Connectors Mechanical Drawing

Chapter 3

BIOS Settings

AMIBIOS has been integrated into many motherboards for over a decade. With the AMIBIOS setup program, you can modify BIOS settings and control the various system features. This chapter describes the basic navigation of the MIO-5270 BIOS setup screens.

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in battery-backed CMOS so it retains the Setup information when the power is turned off.

3.1 Entering Setup

Turn on the computer and check for the "patch" code. If there is a number assigned to the patch code, it means that the BIOS supports your CPU. If there is no number assigned to the patch code, please contact an Advantech application engineer to obtain an up-to-date patch code file. This will ensure that your CPU system status is valid. After ensuring that you have a number assigned to the patch code, press <DEL> and you will immediately be allowed to enter Setup.

3.2 Main Setup

When you first enter the BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Information
BIOS Vendor American Megatrends
Core Version 4.6.4.1 0.15 x64
Compliancy UEFI 2.1
Project Version MIO-5270 5270X016
Build Date and Time 09/29/2011 14:08:07
Memory Information
Total Memory 2032 MB (DDR3)
System Date [Fri 09/30/2011]
System Time [10:37:23]
Access Level Administrator
Set the Date. Use Tab to switch between Data elements.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

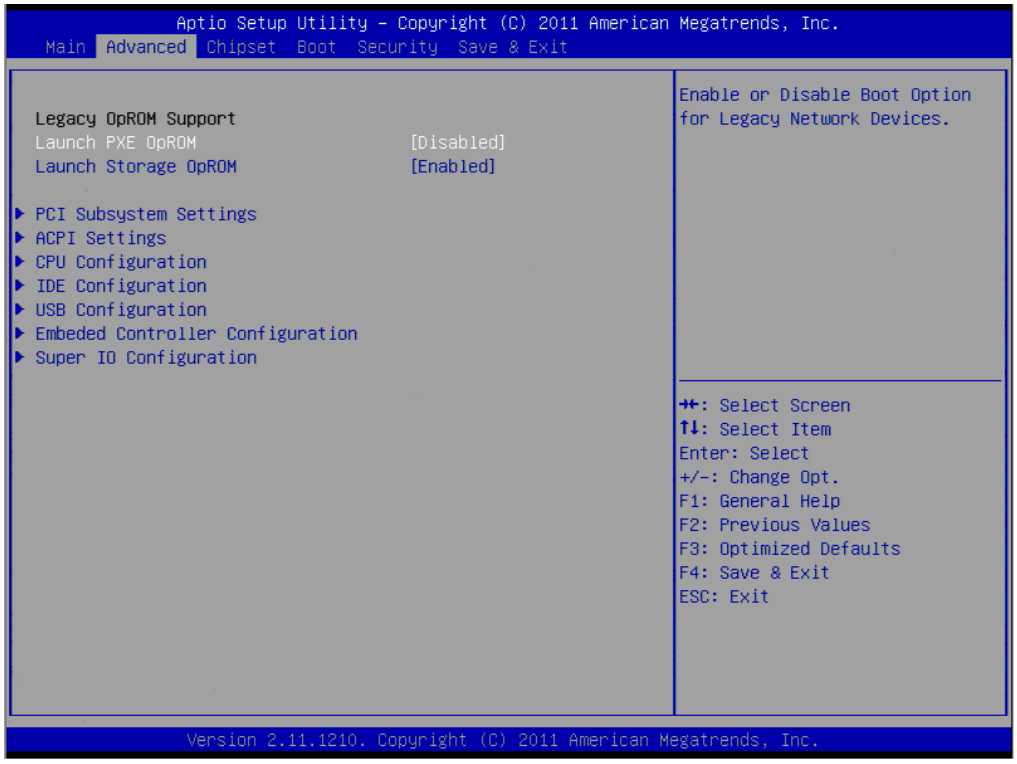
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

3.2.1 System date / System time

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

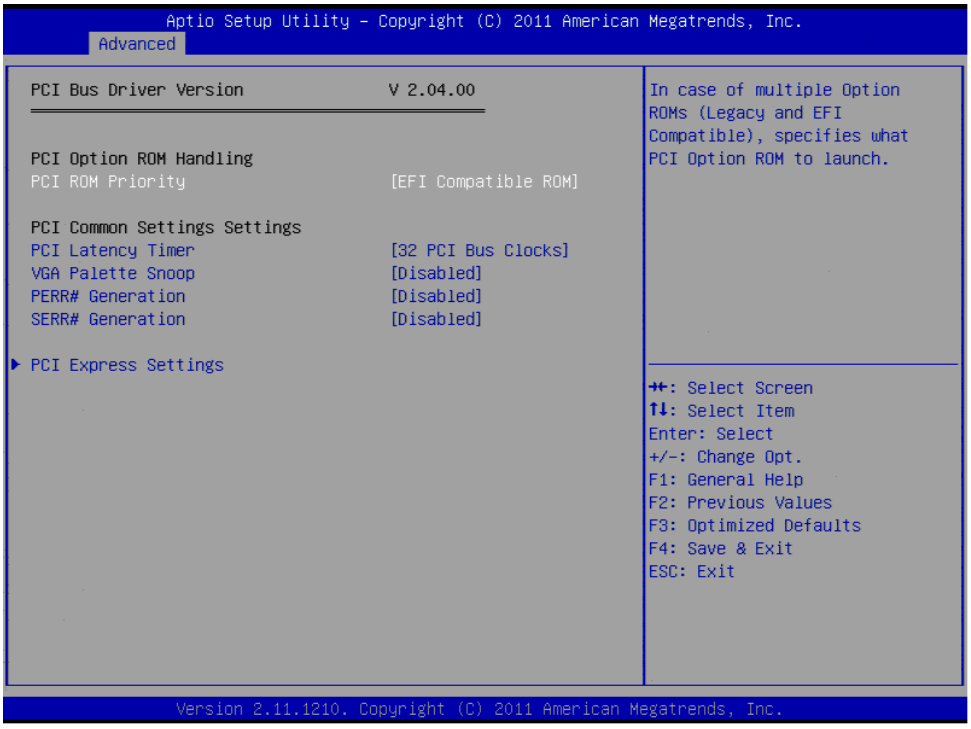
3.3 Advanced BIOS Features Setup

Select the Advanced tab from the MIO-5270 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.



- **Launch PXE OpROM**
  Enable or disable boot option for legacy network devices.
- **Launch Storage OpROM**
  Enable or disable boot option for legacy mass storage with option ROM.

3.3.1 PCI Subsystem Settings Configuration


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
PCI Bus Driver Version V 2.04.00
PCI Option ROM Handling
PCI ROM Priority [EFI Compatible ROM]
PCI Common Settings Settings
PCI Latency Timer [32 PCI Bus Clocks]
VGA Palette Snoop [Disabled]
PERR# Generation [Disabled]
SERR# Generation [Disabled]
PCI Express Settings
In case of multiple Option ROMs (Legacy and EFI Compatible), specifies what PCI Option ROM to launch.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

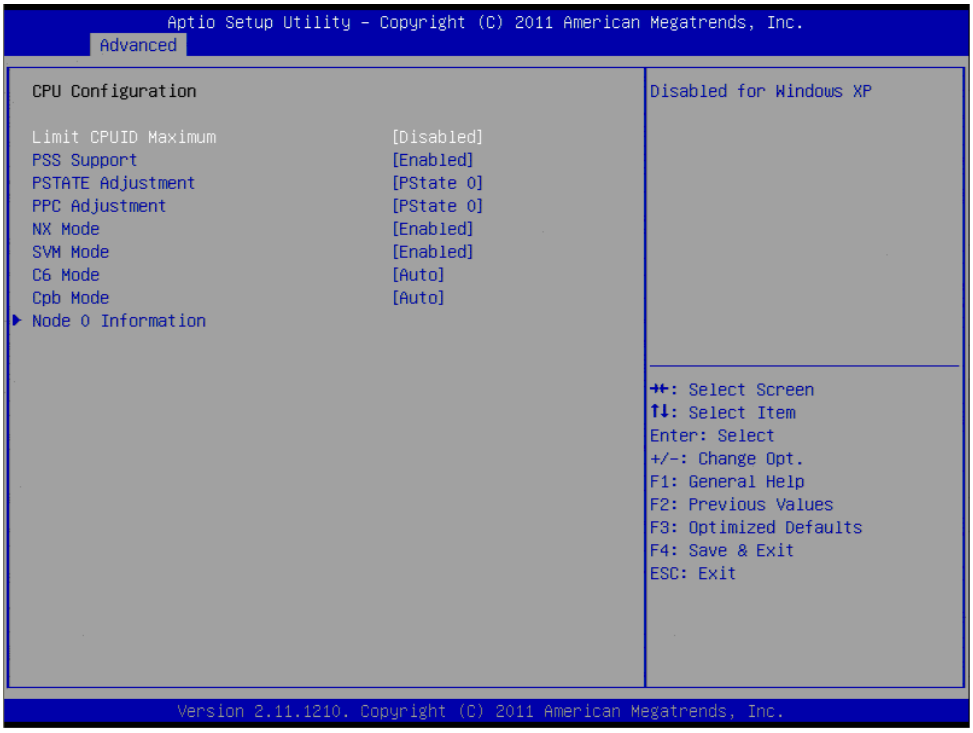
- **PCI ROM Priority**
  This item allows you to select the EFI ROM and Legacy ROM priority.
- **PCI Latency Timer**
  This item allows you to select the 32/64/96/128/160/192/224/248 PCI bus clocks.
- **VGA Palette Snoop**
  Enabled or disable VGA palette registers snooping.
- **PERR# Generation**
  Enabled or disable PCI device to generation PERR#.
- **SERR# Generation**
  Enabled or disable PCI device to generation SERR#.
- **PCI Express Settings**
  Change PCI express device detail settings.

3.3.2 ACPI Settings Configuration

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
ACPI Settings
ACPI Sleep State [S3 (Suspend to RAM)]
S3 Video Repost [Disabled]
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

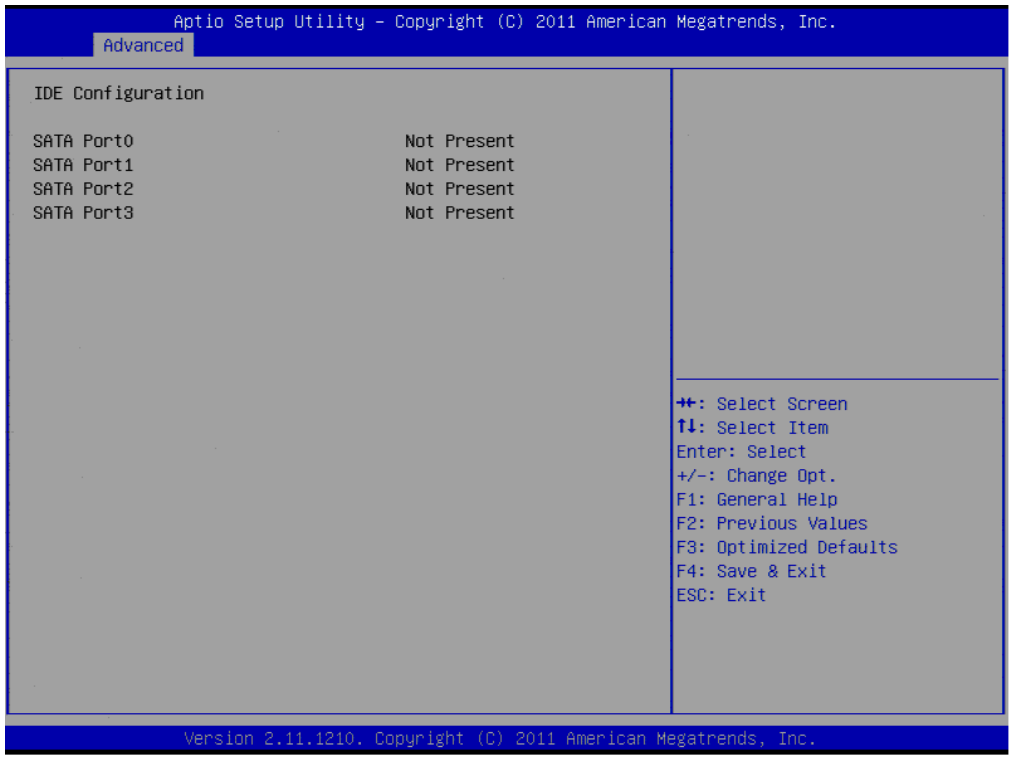
- **ACPI Sleep State**
  Select the ACPI state used for system suspend.
- **S3 Video Repost**
  Enable or disable video repost.

3.3.3 CPU Configuration



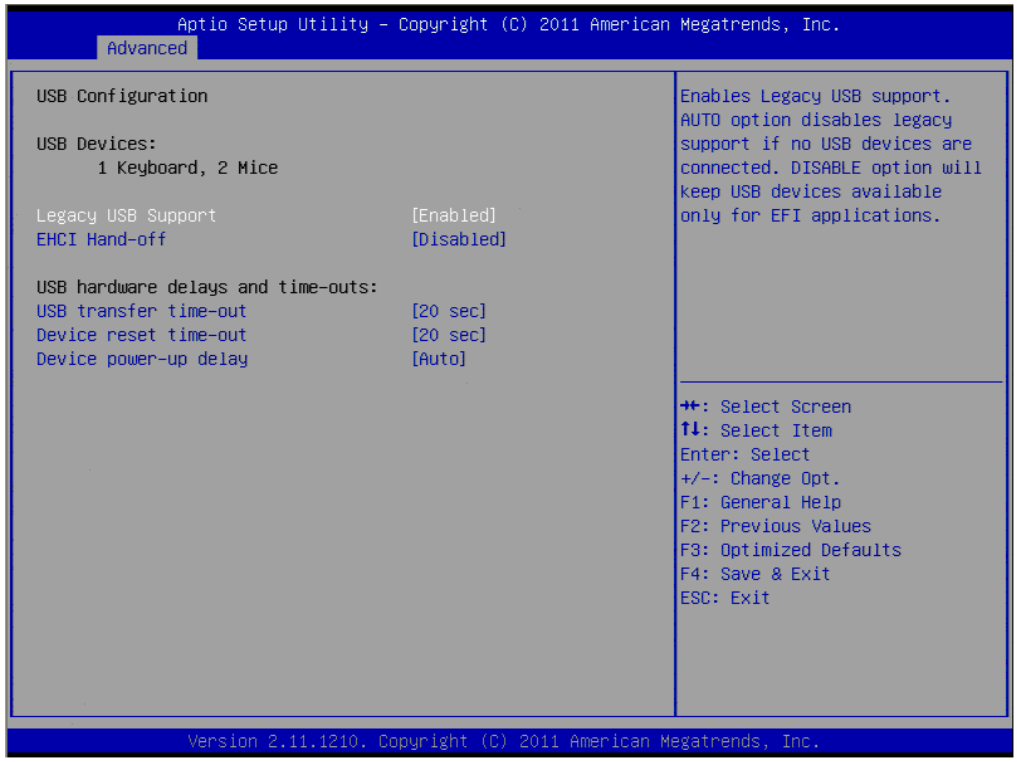
- **Limit CPUID Maximum**
  This item allows you to disable for Windows XP.
- **PPS Support**
  This item allows you to enable or disable the ACPI _PPC, _PSS, and _PCT objects.
- **PSTATE Adjustment**
  This item allows you to provide P-state level.
- **PPC Adjustment**
  This item allows you to provide _PPC object.
- **NX Mode**
  This item allows you to enable or disable the No-execute page protection function.
- **SVM Mode**
  This item allows you to enable or disable the CPU virtualization.
- **C6 Mode**
  This item allows you to auto or disable C6 function.
- **Cpb Mode**
  This item allows you to auto or disable CPB.
- **Node 0 Information**
  View detail of memory information related to node 0.

3.3.4 IDE Configuration



- **IDE Configuration**
  Display SATA Port0 / SATA Port1 / SATA Port2 / SATA Port3 information.

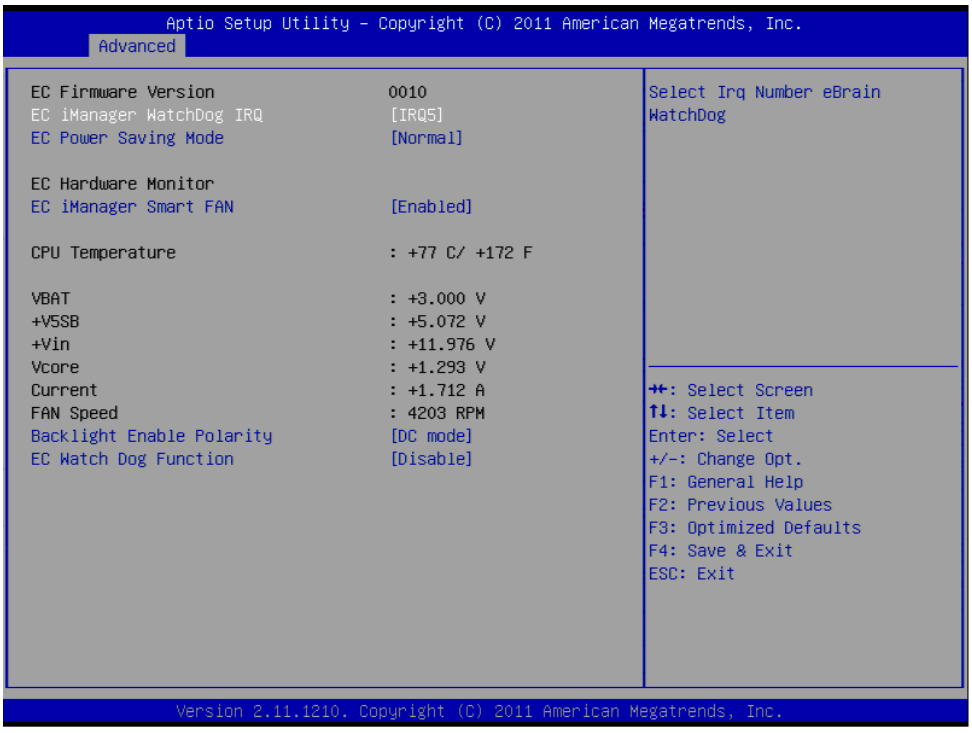
3.3.5 USB Configuration


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
USB Configuration
USB Devices:
1 Keyboard, 2 Mice
Legacy USB Support [Enabled]
EHCI Hand-off [Disabled]
USB hardware delays and time-outs:
USB transfer time-out [20 sec]
Device reset time-out [20 sec]
Device power-up delay [Auto]
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

- **Legacy USB Support**
  Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **EHCI Hand-Off**
  This is a workaround for OS without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.
- **USB transfer time-out**
  Time-out value for control, bulk, and interrupt transfers.
- **Device reset time-out**
  USB mass storage device starts unit command time-out.
- **Device power-up delay**
  Maximum time the device will take before it properly report itself to the host controller.

3.3.6 Embedded Controller Configuration

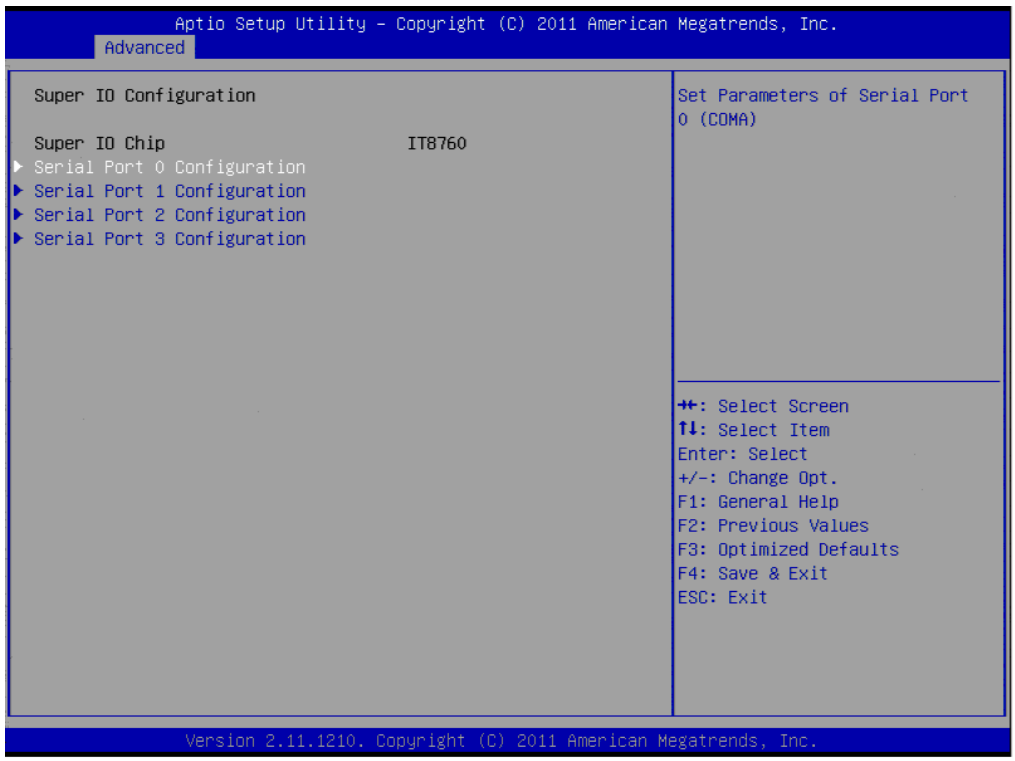
Embedded Controller Configuration


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
EC Firmware Version 0010
EC iManager WatchDog IRQ [IRQ5]
EC Power Saving Mode [Normal]
EC Hardware Monitor
EC iManager Smart FAN [Enabled]
CPU Temperature : +77 C/ +172 F
VBAT : +3.000 V
+V5SB : +5.072 V
+Vin : +11.976 V
Vcore : +1.293 V
Current : +1.712 A
FAN Speed : 4203 RPM
Backlight Enable Polarity [DC mode]
EC Watch Dog Function [Disable]
Select Irq Number eBrain WatchDog
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

- **EC iManager WatchDog IRQ**
  This item allows you to select IRQ number for watchdog.
- **EC Power Saving Mode**
  This item allows you to select normal or deep sleep power saving.
- **EC iManager Smart FAN**
  This item allows you to enable or disable EC smart FAN control.
- **Temperature & Voltage show**
  CPU Temperature
  VBAT / +V5SB / +Vin / Vcore /
- **Current**
  Display current.

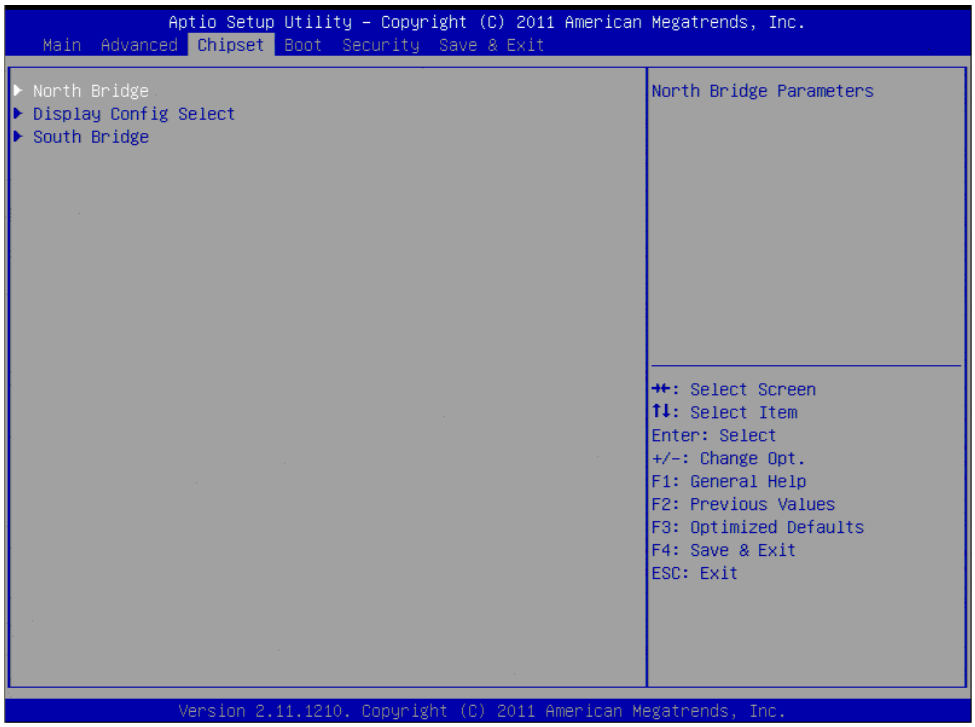
- **Fan Speed show**
  Display Fan Speed RPM.
- **Backlight Enable Polarity**
  This item allows you to select polarity for PWM or DC mode.
- **EC Watch Dog Function**
  This item allows you to select the watchdog timer.

3.3.7 Super I/O Configuration



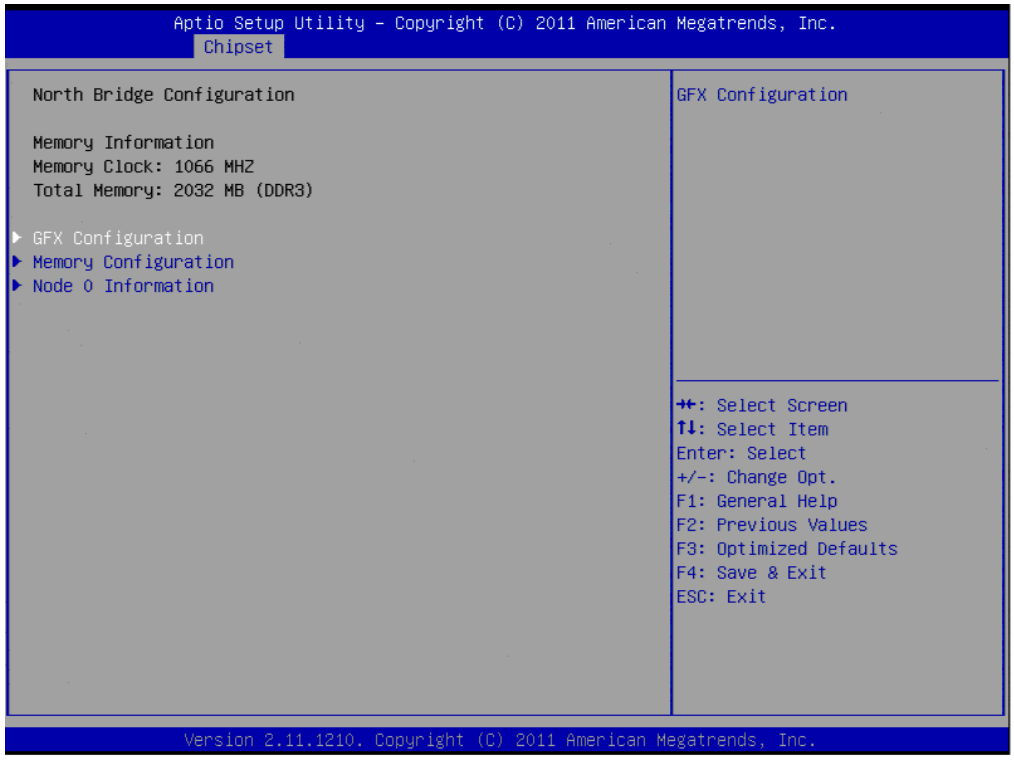
- **Serial Port1 / Port2 / Port3 / Port4 address**
  This item allows you to select serial port1 ~ port4 of base addresses.
- **Serial Port1 / Port2 / Port3 / Port4 IRQ**
  This item allows you to select serial port1 ~ port4 of IRQ.
- **Auto Flow Control For Serial Port1**
  This item allows you to enable or disable auto flow control function.

3.4 Chipset Configuration



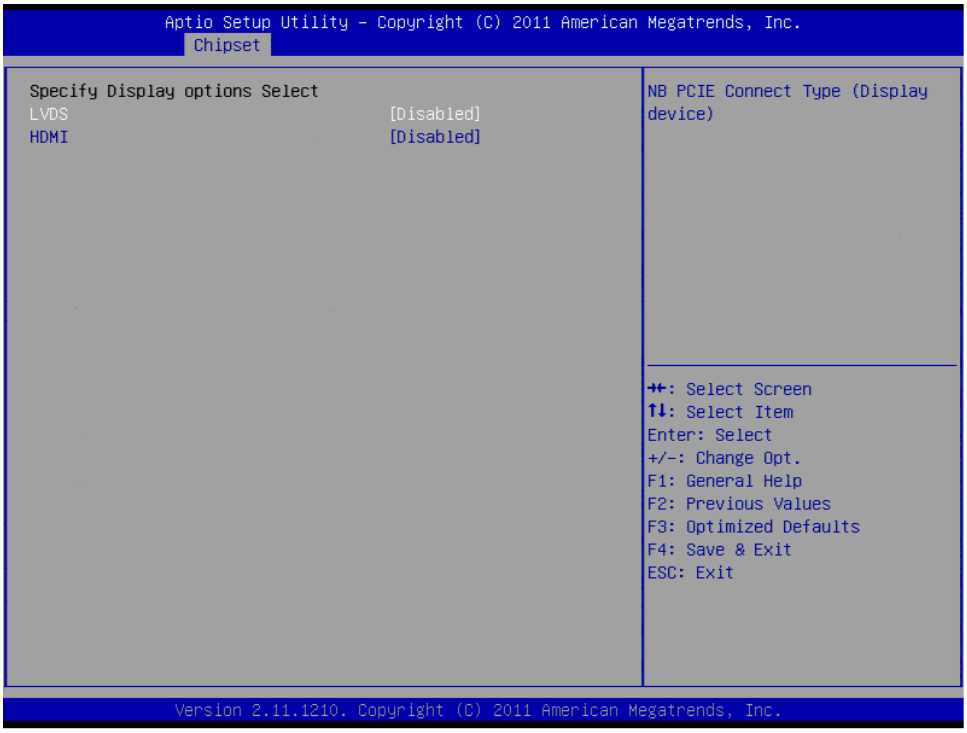
- **North Bridge**
  Detail for North Bridge items.
- **Display Config Select**
  Detail for display items.
- **South Bridge**
  Detail for South Bridge items.

3.4.1 North Bridge Configuration



- **GFX Configuration**
  Details of LAN1/LAN2, and PSPP Policy items.
- **Memory Configuration**
  Details of Bank Interleaving, IOMMU Mode, and Memory Clock items.
- **Node 0 Information**
  Details of memory information.

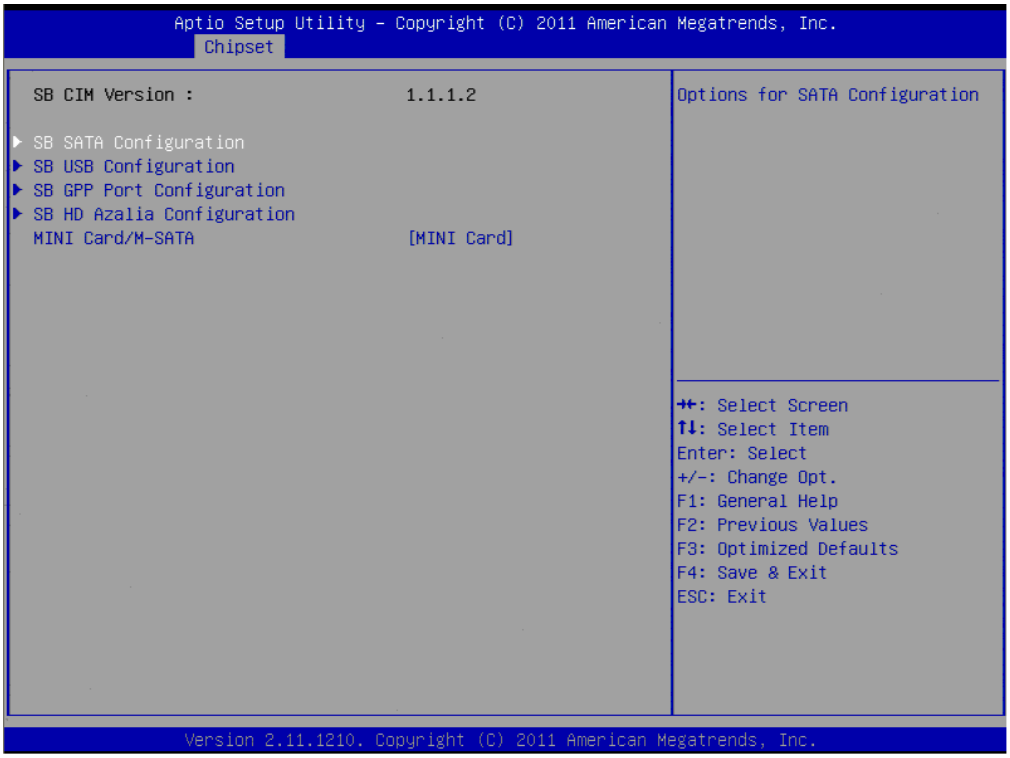
3.4.2 Display Configuration Select



- **LVDS***
  This item allows you to enable or disable LVDS function.
- **HDMI**
  This item allows you to enable or disable HDMI function.

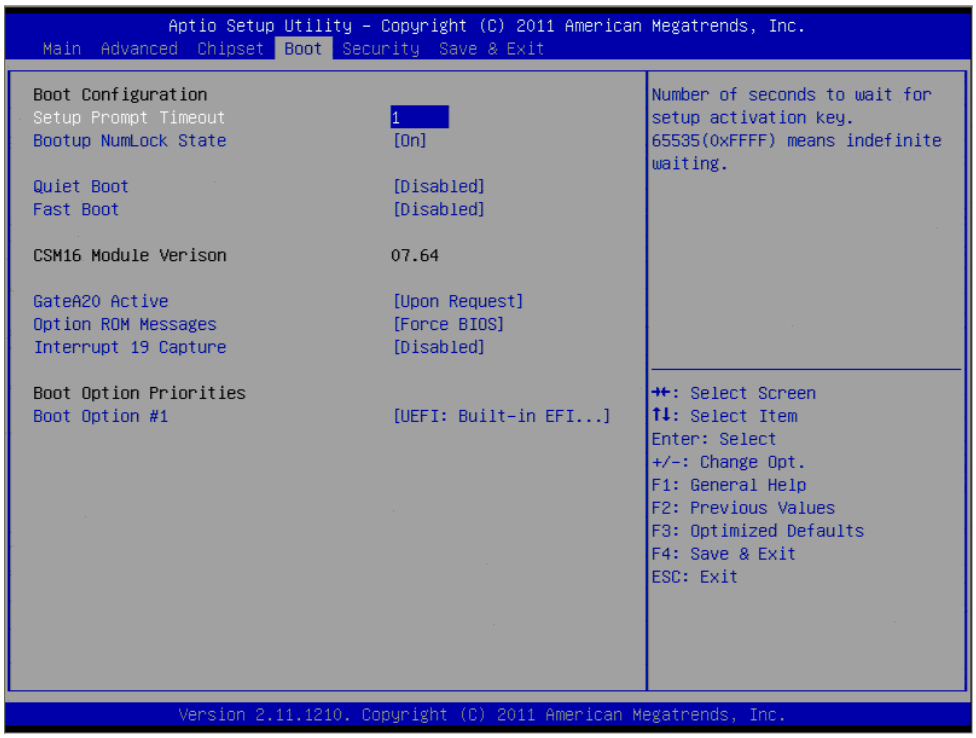
* LVDS setting of customized define, please refer to the document on CD-ROM: "Chrontel EEPROM Adjust SOP.PDF"

3.4.3 South Bridge



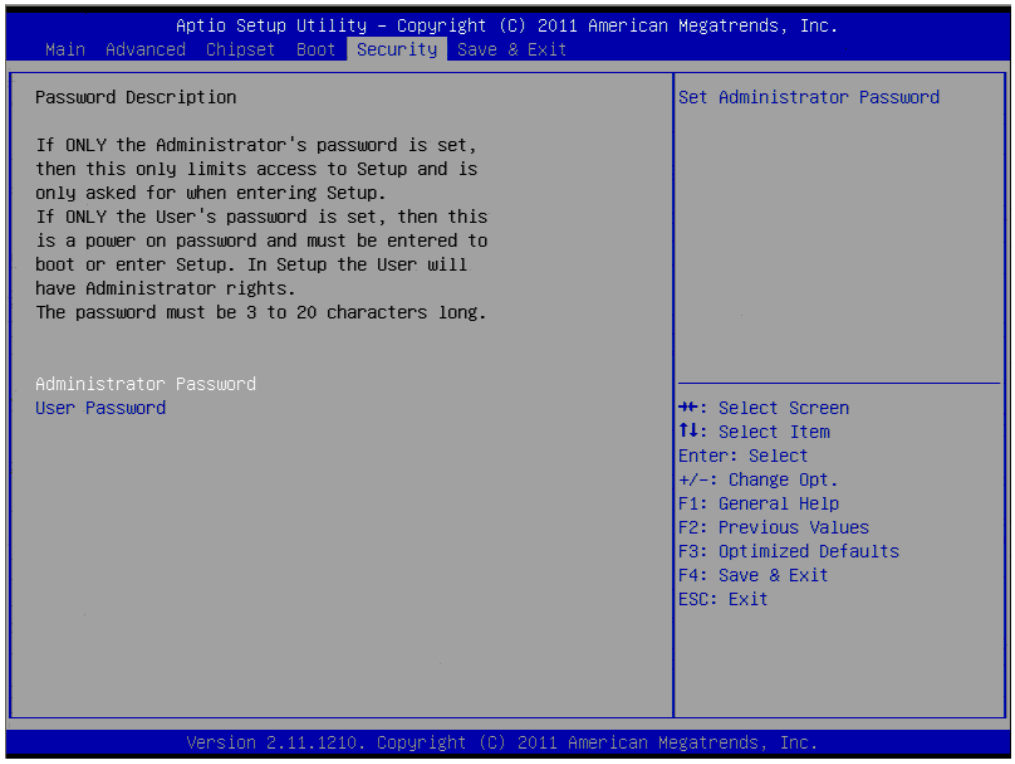
- **SB SATA Configuration**
  Options for SATA configuration.
- **SB USB Configuration**
  Options for SB USB configuration.
- **SB GPP Port Configuration**
  Options for SB GPP port configuration.
- **SB HD Azalia Configuration**
  Options for SB HD Azalia.
- **MINI Card/M-SATA**
  This item allows you to select MINI card or M-SATA.

3.5 Boot Configuration



- **Setup Prompt Timeout**
  This item allows you to change number of seconds to wait for setup activation key.
- **Bootup NumLock State**
  Select the Power-on state for Numlock.
- **Quiet Boot**
  If this option is set to Disabled, the BIOS displays normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.
- **Fast Boot**
  This item allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
- **GateA20 Active**
  This item allows you to select Upon request or Always.
- **Option ROM Messages**
  Sets display mode for option ROM.
- **Interrupt 19 Capture**
  This item allows option ROMs to trap interrupt 19.
- **Boot Option**
  Sets the system boot order.

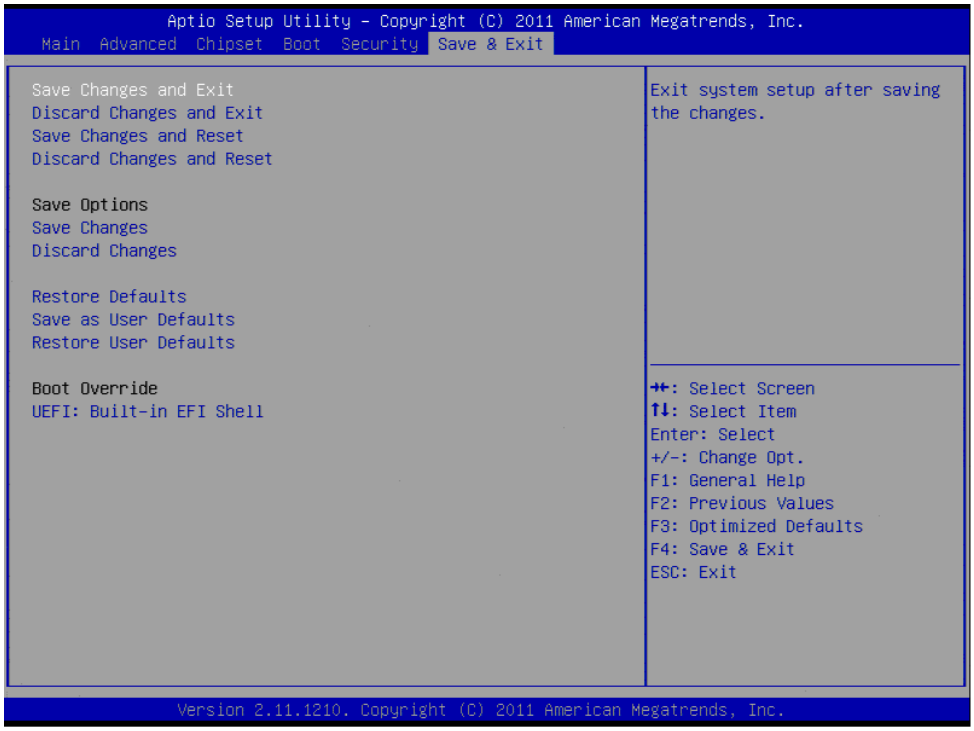
3.6 Security Configuration


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password must be 3 to 20 characters long.
Administrator Password
User Password
Set Administrator Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

Select Security Setup from the MIO-5270 Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection are described in this section. To access the sub menu for the following items, select the item and press <Enter>:

Change Administrator / User Password

3.7 Save & Exit



- **Save Changes and Exit**
  This item allows you to exit system setup after saving changes.
- **Discard Changes and Exit**
  This item allows you to exit system setup without saving any changes.
- **Save Changes and Reset**
  This item allows you to reset the system after saving the changes.
- **Discard Changes and Reset**
  This item allows you to rest system setup without saving any changes.
- **Save Changes**
  This item allows you to save changes done so far to any of the options.
- **Discard Changes**
  This item allows you to discard changes done so far to any of the options.
- **Restore Defaults**
  This item allows you to restore/load default values for all the options.
- **Save as User Defaults**
  This item allows you to save the changes done so far as user defaults.
- **Restore User Defaults**
  This item allows you to restore the user defaults to all the options.
- **Boot Override**
  Boot device select can override your boot priority.

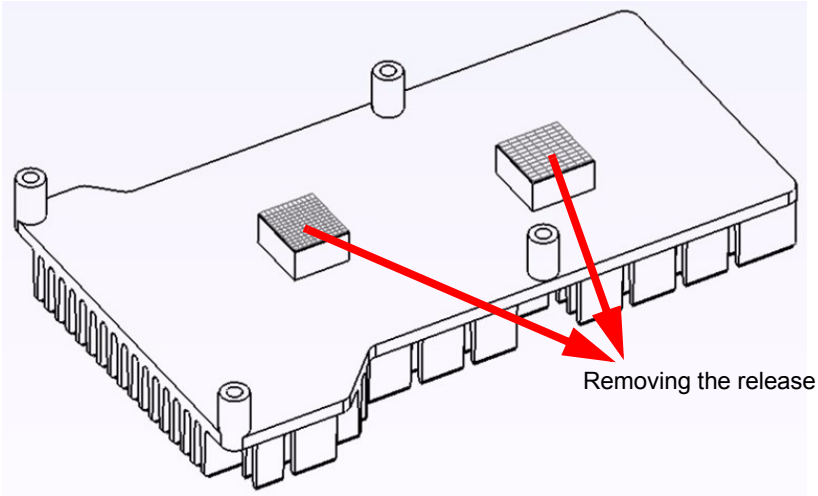
Chapter 4

MIOe Installation

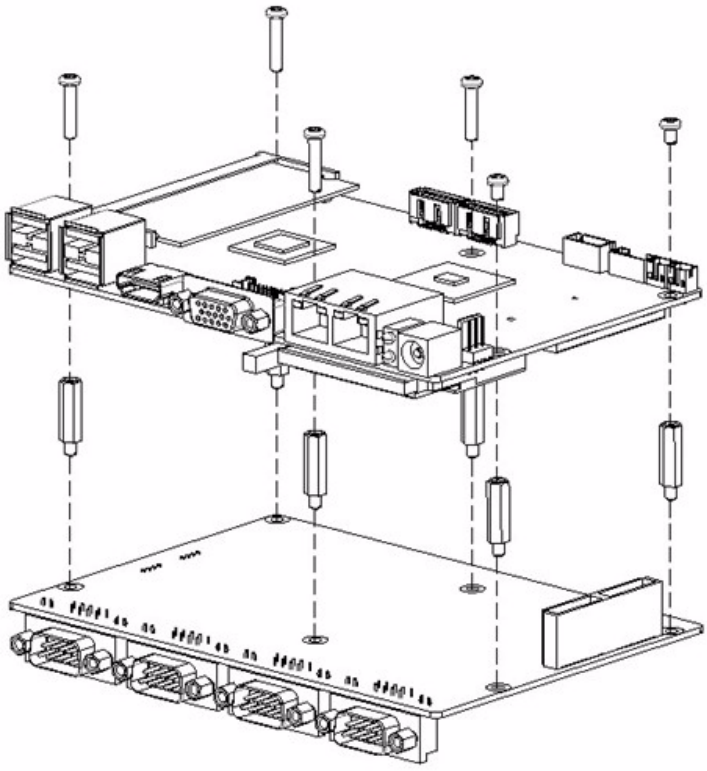
MIO compact form factor SBC is a new generation SBC design with a variety of mechanical improvements. Here is the quick installation guide to introduce our thermal design and MIOe module installation.

Quick Installation guide:

1. There is a Heatsink / Cooler in the white box inside the package. Please be careful, remove the release paper from the thermal pad before installation.



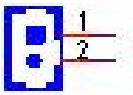
2. There are six screws inside the white box, please install DRAM in the SO-DIMM socket first, then screw the heatsink as below. Four long screws are for the heatsink, two shorter screws are for the main board.
3. There are six standoff's on the MIOe module which can also can be installed with the screws and copper studs.



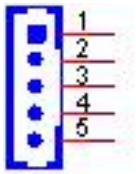
Appendix A

Pin Assignments

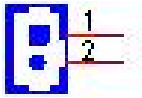
CN1	Power Switch
Part Number	1655302020
Footprint	WF_2P_79_BOX_R1_D
Description	WAFER BOX 2P 2.0mm 180D(M) DIP A2001WV2-2P
Pin	Pin Name
1	PSIN
2	GND



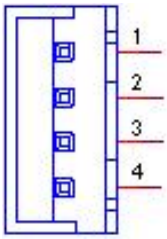
CN2	Inverter Power Output
Part Number	1655000453
Footprint	WHL5V-2M-24W1140
Description	WAFER BOX 2.0mm 5P 180D(M) DIP WO/Pb JIH VEI
Pin	Pin Name
1	+12V
2	GND
3	ENABKL
4	VBR
5	+5V



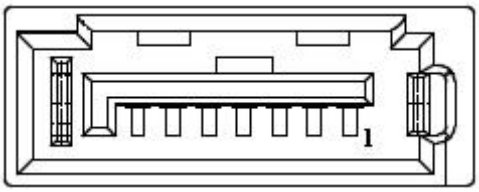
CN3	Reset
Part Number	1655302020
Footprint	WF_2P_79_BOX_R1_D
Description	WAFER BOX 2P 2.0mm 180D(M) DIP A2001WV2-2P
Pin	Pin Name
1	RESET#
2	GND



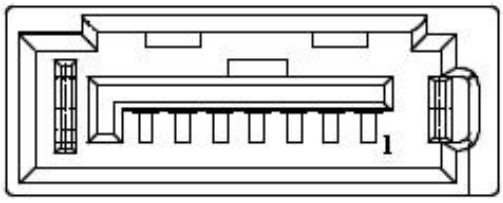
CN4	SATA Power
Part Number	1655001154
Footprint	WF_4P_98_BOX_R1_D
Description	WAFER BOX 4P 2.50mm 180D(M) DIP 24W1170-04S10-01
Pin	Pin Name
1	+5V
2	GND
3	GND
4	+12V



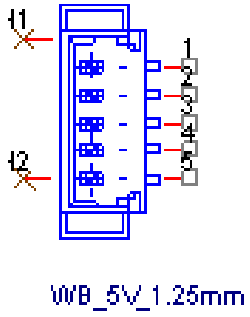
CN5	SATA 1
Part Number	1654007578
Footprint	SATA_7P_WATF-07DBN6SB1U
Description	Serial ATA 7P 1.27mm 180D(M) SMD WATF-07DBN6SB1U
Pin	Pin Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



CN6	SATA 2
Part Number	1654007578
Footprint	SATA_7P_WATF-07DBN6SB1U
Description	Serial ATA 7P 1.27mm 180D(M) SMD WATF-07DBN6SB1U
Pin	Pin Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

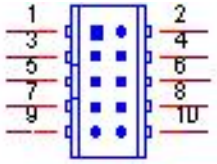


CN7	RS422/485
Part Number	1655304032
Footprint	WF_5P_49_BOX_85205
Description	WAFER 5P 1.25mm 180D(M) SMD 85205-05701
Pin	Pin Name
1	422RX-
2	422RX+
3	422/485TX+
4	422/485TX-
5	GND

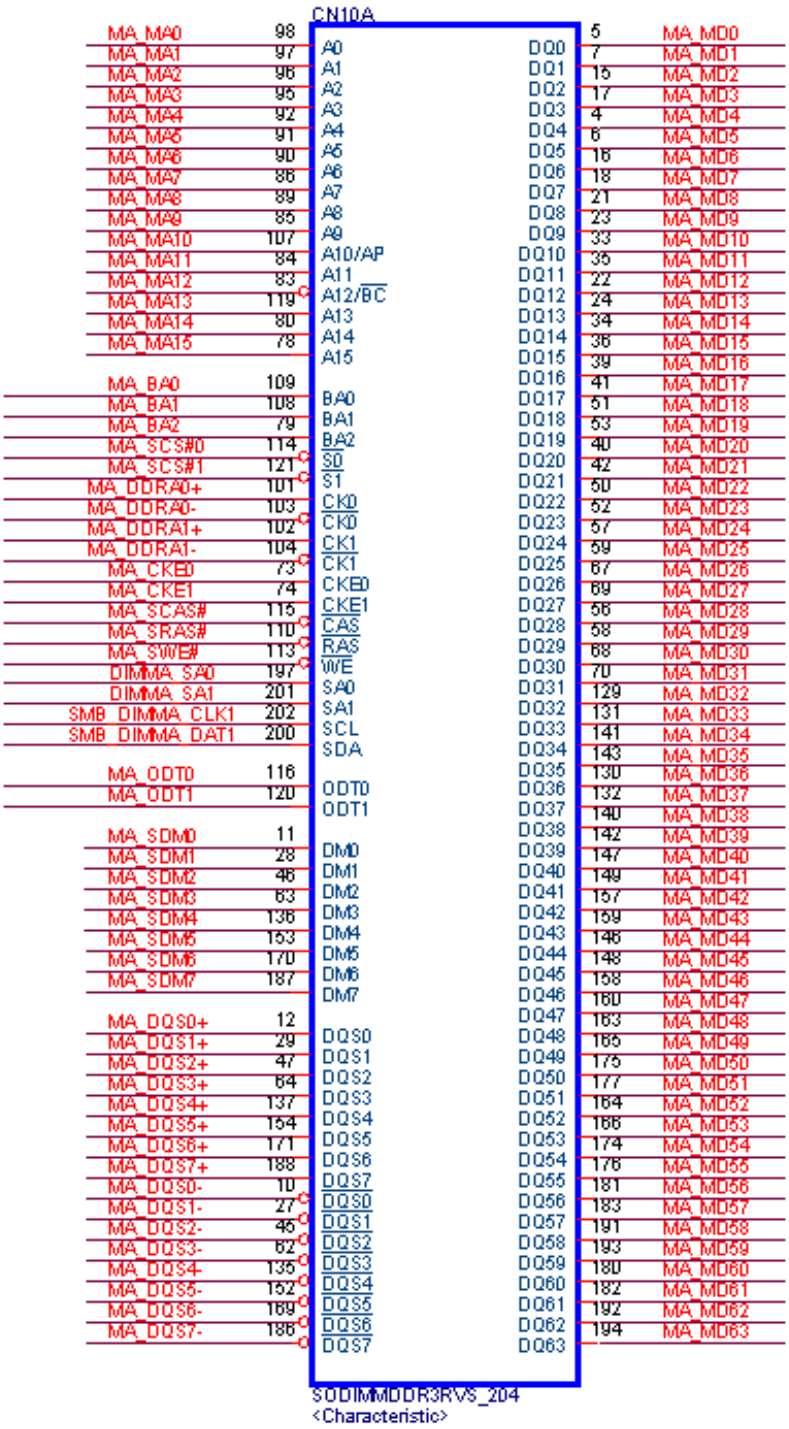


WB_5V_1.25mm

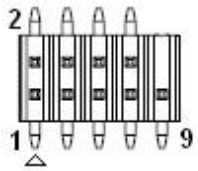
CN8	**GPIO**
Part Number	1653004099
Footprint	HD_5x2P_79_23N685B-10M10
Description	BOX HEADER 5x2P 2.00mm 180D(M) SMD 23N685B-10M10
Pin	Pin Name
1	+5V
2	GPIO4
3	GPIO0
4	GPIO5
5	GPIO1
6	GPIO6
7	GPIO2
8	GPIO7
9	GPIO3
10	GND



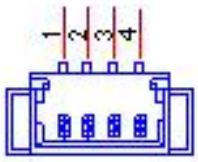
CN10	DDR3 SODIMM Socket
Part Number	1651001648
Footprint	DDR3_204P_2-2013311-1
Description	DDR3 SODIMM H=9.2mm 204P SMD 2-2013311-1
Pin	Pin Name



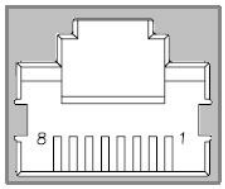
CN12	Internal USB
Part Number	1653005260
Footprint	HD_5x2P_79_N10
Description	PIN HEADER 2x5P 2.0mm 180D(M) SMD 21N22050
Pin	Pin Name
1	+5V
2	+5V
3	A_D-
4	B_D-
5	A_D+
6	B_D+
7	GND
8	GND
9	GND



CN13	SMBus
Part Number	1655904020
Footprint	FPC4V-125M
Description	WAFER 4P 1.25mm 180D(M) SMD 85205-04001
Pin	Pin Name
1	GND
2	SMB_DAT
3	SMB_CLK
4	+5V

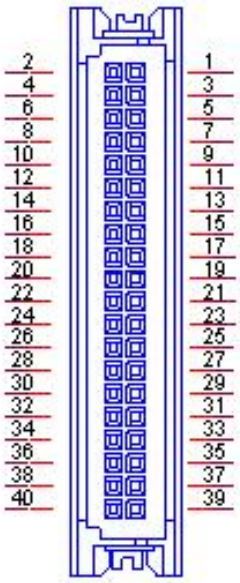


CN14	LAN
Part Number	1652003274
Footprint	RJ45_28P_RTB-19GB9J1A
Description	PHONE JACK RJ45 28P DIP RTB-19GB9J1A
Pin	Pin Name
1	TX+(10/100),BI_DA+(GHz)
2	TX-(10/100),BI_DA-(GHz)
3	RX+(10/100),BI_DB+(GHz)
4	BI_DC+(GHz)
5	BI_DC-(GHz)
6	RX-(10/100),BI_DB-(GHz)
7	BI_DD+(GHz)
8	BI_DD-(GHz)

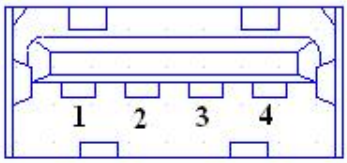


CN17	48 bits LVDS Panel
Part Number	1653920200
Footprint	SPH20X2
Description	B/B Conn. 40P 1.25mm 90D SMD DF13-40DP-1.25V
Pin	Pin Name
1	+3.3V, +5V or +12V
2	+3.3V, +5V or +12V
3	GND
4	GND
5	+3.3V, +5V or +12V
6	+3.3V, +5V or +12V
7	LVDS0_D0-
8	LVDS1_D0-
9	LVDS0_D0+
10	LVDS1_D0+
11	GND
12	GND
13	LVDS0_D1-
14	LVDS1_D1-
15	LVDS0_D1+
16	LVDS1_D1+
17	GND
18	GND
19	LVDS0_D2-

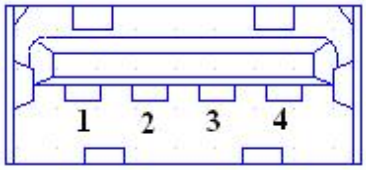
20	LVDS1_D2-
21	LVDS0_D2+
22	LVDS1_D2+
23	GND
24	GND
25	LVDS0_CLK-
26	LVDS1_CLK-
27	LVDS0_CLK+
28	LVDS1_CLK+
29	GND
30	GND
31	NC
32	NC
33	GND
34	GND
35	LVDS0_D3-
36	LVDS1_D3-
37	LVDS0_D3+
38	LVDS1_D3+
39	NC
40	NC



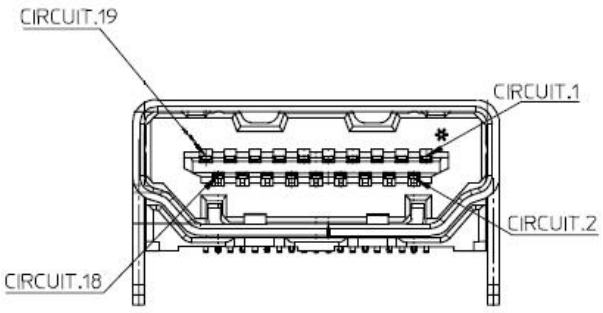
CN18	External USB
Part Number	1654009513
Footprint	USB_8P_UB1112C-8FDE-4F
Description	
Pin	Pin Name
1	+5V
2	D-
3	D+
4	GND



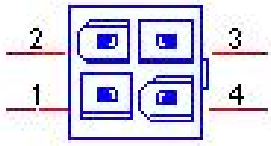
CN19	External USB
Part Number	1654009513
Footprint	USB_8P_UB1112C-8FDE-4F
Description	
Pin	Pin Name
1	+5V
2	D-
3	D+
4	GND



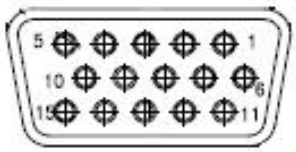
CN20	HDMI
Part Number	1654009225
Footprint	HDMI_19P_QJ51193-FFD4-7F
Description	HDMI Conn 19P 0.5mm 90D(M) SMD QJ51193-FFB4-7F
Pin	Pin Name
1	TMDS Data2+
2	TMDS Data2 Shield
3	TMDS Data2®C
4	TMDS Data1+
5	TMDS Data1 Shield
6	TMDS Data1®C
7	TMDS Data0+
8	TMDS Data0 Shield
9	TMDS Data0®C
10	TMDS Clock+
11	TMDS Clock Shield
12	TMDS Clock®C
13	Reserved
14	Reserved
15	SCL
16	SDA
17	DDC Ground
18	+5V Power
19	Hot Plug Detect



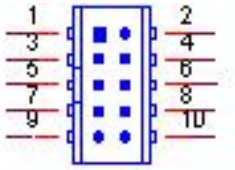
CN22	12V Power Input
Part Number	1655404090
Footprint	WF_2x2P_165_BOX_RA_D_740SP
Description	ATX PWR CONN. 2x2P 4.2mm 180D(M) DIP 24W4310-04S
Pin	Pin Name
1	GND
2	GND
3	+12V
4	+12V



CN23	VGA
Part Number	1654000055
Footprint	DBVGA-VF5MS
Description	D-SUB Conn. 15P 90D(F) DIP 070242FR015S200ZU
Pin	Pin Name
1	RED
2	GREEN
3	BLUE
4	NC
5	GND
6	GND
7	GND
8	GND
9	NC
10	GND
11	NC
12	DDAT
13	HSYNC
14	VSYNC
15	DCLK

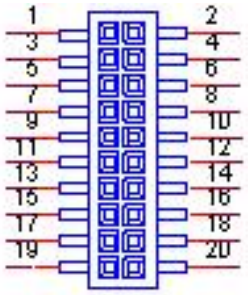


CN24	Audio
Part Number	1653004099
Footprint	HD_5x2P_79_23N685B-10M10
Description	BOX HEADER 5x2P 2.00mm 180D(M) SMD 23N685B-10M10
Pin	Pin Name
1	LOUTR
2	LINR
3	GND
4	GND
5	LOUTL
6	LINL
7	GND
8	GND
9	MIC1R
10	MIC1L

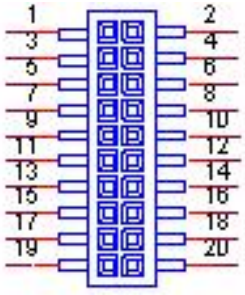


CN25	COM1/COM2
Part Number	1653004793
Footprint	HD_10x2P_79_23N685B-20M10
Description	
Pin	Pin Name
1	DCD1#
2	DSR1#
3	RXD1
4	RTS1#
5	TXD1
6	CTS1#
7	DTR1#
8	RI1#
9	GND
10	GND
11	DCD2#
12	DSR2#
13	RXD2
14	RTS2#
15	TXD2
16	CTS2#
17	DTR2#
18	RI2#

19	GND
20	GND

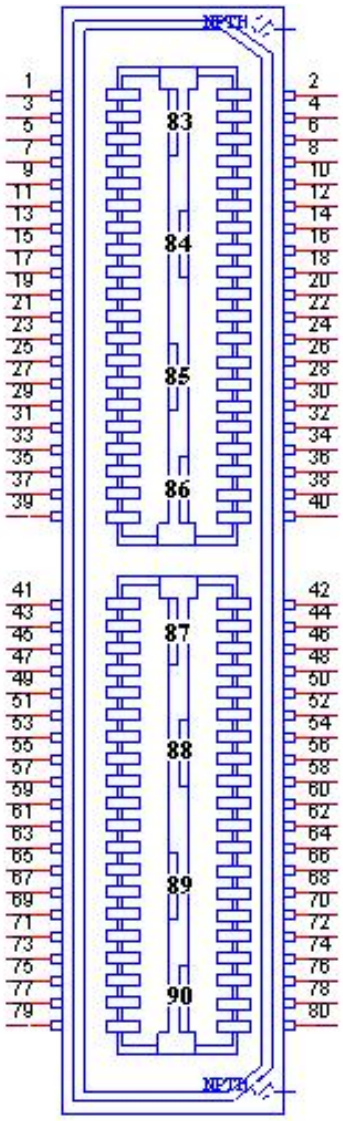


CN26	**COM3/COM4**
Part Number	1653004793
Footprint	HD_10x2P_79_23N685B-20M10
Description	
Pin	Pin Name
1	DCD3#
2	DSR3#
3	RXD3
4	RTS3#
5	TXD3
6	CTS3#
7	DTR3#
8	RI3#
9	GND
10	GND
11	DCD4#
12	DSR4#
13	RXD4
14	RTS4#
15	TXD4
16	CTS4#
17	DTR4#
18	RI4#
19	GND
20	GND

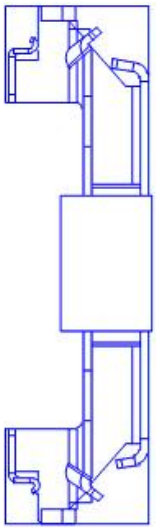


CN28	**MIOe**
Part Number	1654006235
Footprint	BB_40x2P_32_1625x285_2HOLD
Description	
Pin	Pin Name
1	GND
2	GND
3	PCIE_RX0+
4	PCIE_TX0+
5	PCIE_RX0-
6	PCIE_TX0-
7	GND
8	GND
9	PCIE_RX1+
10	PCIE_TX1+
11	PCIE_RX1-
12	PCIE_TX1-
13	GND
14	GND
15	PCIE_RX2+
16	PCIE_TX2+
17	PCIE_RX2-
18	PCIE_TX2-
19	GND
20	GND
21	PCIE_RX3+
22	PCIE_TX3+
23	PCIE_RX3-
24	PCIE_TX3-
25	GND
26	GND
27	PCIE_CLK+
28	LOUTL
29	PCIE_CLK-
30	LOUTR
31	GND
32	AGND
33	SMB_CLK
34	NC
35	SMB_DAT
36	NC
37	PCIE_WAKE#
38	NC
39	RESET#
40	NC
41	SLP_S3#

42	CLK33M
43	SLP_S5#
44	LPC_AD0
45	DDP_HPD
46	LPC_AD1
47	GND
48	LPC_AD2
49	DDP_AUX+
50	LPC_AD3
51	DDP_AUX-
52	LPC_DRQ#0
53	GND
54	LPC_SERIRQ
55	DDP_D0+
56	LPC_FRAME#
57	DDP_D0-
58	GND
59	GND
60	USB0_D+
61	DDP_D1+
62	USB0_D-
63	DDP_D1-
64	GND
65	GND
66	USB1_D+/USB_SSTX+
67	DDP_D2+
68	USB1_D-/USB_SSTX-
69	DDP_D2-
70	GND
71	GND
72	USB2_D+/USB_SSRX+
73	DDP_D3+
74	USB2_D-/USB_SSRX-
75	DDP_D3-
76	GND
77	GND
78	USB_OC#
79	+12VSB
80	NC
83	GND
84	GND
85	GND
86	GND
87	+5VSB
88	+5VSB
89	+5VSB
90	+5VSB

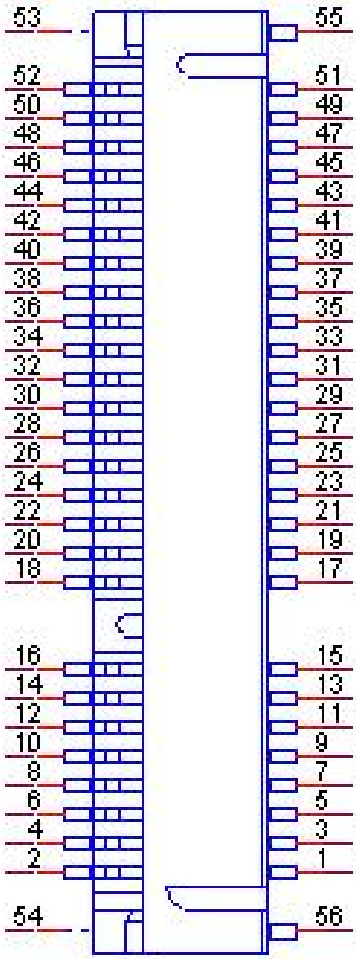


CN29	**PCIe Mini Card Holder**
Part Number	1654002539
Footprint	FOX_AS0B226-S68K7F_HOLDER
Description	MINI PCI Express 52P 6.8mm 90D SMD AS0B226-S68K7
Pin	Pin Name
1	GND
2	GND
3	GND
4	GND
5	NC
6	NC



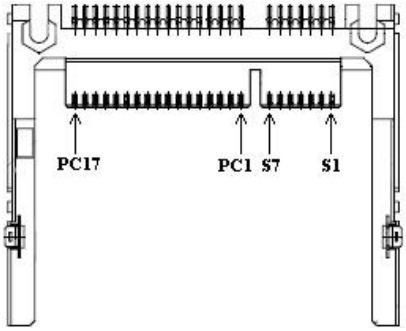
CN30	PCIe Mini Card
Part Number	1654002538
Footprint	FOX_AS0B226-S68K7F
Description	MINI PCI Express 52P 6.8mm 90D SMD AS0B226-S68N7
Pin	Pin Name
1	WAKE#
2	+3.3VSB
3	NC
4	GND
5	NC
6	+1.5V
7	NC
8	NC
9	GND
10	NC
11	REFCLK-
12	NC
13	REFCLK+
14	NC
15	GND
16	NC
17	NC
18	GND
19	NC
20	NC
21	GND
22	PERST#
23	PERn0
24	+3.3VSB
25	PERp0
26	GND

27	GND
28	+1.5V
29	GND
30	SMB_CLK
31	PETn0
32	SMB_DAT
33	PETp0
34	GND
35	GND
36	USB D-
37	GND
38	USB D+
39	+3.3VSB
40	GND
41	+3.3VSB
42	NC
43	GND
44	NC
45	NC
46	NC
47	NC
48	+1.5V
49	NC
50	GND
51	NC
52	+3.3VSB
53	NC
54	NC
55	GND
56	GND

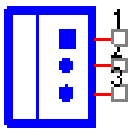


CN31	**CFast**
Part Number	1653004402
Footprint	CFAST_24P_N7E24
Description	CFast 24P 1.27mm 90D(M) SMD N7E24-M516RA-50
Pin	Pin Name
PC1	CDI
PC2	GND
PC3	NC
PC4	NC
PC5	NC
PC6	NC
PC7	GND
PC8	NC
PC9	NC
PC10	NC
PC11	NC
PC12	NC
PC13	+3.3V
PC14	+3.3V
PC15	GND

PC16	GND
PC17	CDO
S1	GND
S2	TX+
S3	TX-
S4	GND
S5	RX-
S6	RX+
S7	GND



FAN1	**CPU FAN**
Part Number	1655003010
Footprint	W_3V_2.54mm
Description	Wafer 2.54mm 3P 180D(M) DIP W/LOCK 22-27-2031
Pin	Pin Name
1	GND
2	PWM
3	TACH



Appendix B

System Assignment

B.1 System I/O Ports

Table B.1: System I/O Ports	
Addr. Range (Hex)	**Device**
000-01F	DMA Controller
20h-2Dh	Interrupt Controller
50h-52h	Timer/Counter
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	0A0-0BF
0C0-0DF	DMA controller
170h-177h	IDE Controller
1F0h-1F7h	IDE Controller
299h-29Ah	EC HM Index port and Data port
29Ch-29Dh	EC Index port and Data port
2E8-2EF	Serial port 4
2F8-2FF	Serial port 2
3E8-3EF	Serial port 3
3F8-3FF	Serial port 1

B.2 1st MB memory map

Table B.2: 1st MB memory map	
Addr. Range (Hex)	**Device**
F0000h - FFFFFh	System ROM
D0000h - EFFFFh	Unused (reserved for Ethernet ROM)
C0000h - CEFFFh	Expansion ROM (for VGA BIOS)
B8000h - BFFFFh	CGA/EGA/VGA text
B0000h - B7FFFh	Unused
A0000h - AFFFFh	EGA/VGA graphics
00000h - 9FFFFh	Base memory

B.3 Interrupt assignments

Table B.3: Interrupt assignments

Interrupt#	Interrupt source
IRQ0	Interval timer
IRQ1	Keyboard
IRQ2	Interrupt from controller 2 (cascade)
IRQ3	COM2
IRQ4	COM1
IRQ5	EC Watch DOG
IRQ6	Reserved
IRQ7	COM3
IRQ8	RTC
IRQ9	Reserved
IRQ10	Reserved
IRQ11	COM4
IRQ12	Reserved
IRQ13	Math Coprocessor
IRQ14	Primary IDE
IRQ15	Secondary IDE

Appendix C

Watchdog Timer Sample Code

C.1 EC Watchdog Timer sample code

```
EC_Command_Port = 0x29Ah
EC_Data_Port = 0x299h
Write EC HW ram = 0x89
Watch dog event flag = 0x57
Watchdog reset delay time = 0x5E
Reset event = 0x04
Start WDT function = 0x28
================================================
.model small
.486p
.stack 256
.data
.code
org 100h
.STARTup
mov dx, EC_Command_Port
mov al,89h          ; Write EC HW ram.
out dx,al

mov dx, EC_Command_Port
mov al, 5Fh         ; Watchdog reset delay time low byte (5Eh is high byte) index.
out dx,al

mov dx, EC_Data_Port
mov al, 30h         ;Set 3 seconds delay time.
out dx,al

mov dx, EC_Command_Port
mov al,89h          ; Write EC HW ram.
out dx,al

mov dx, EC_Command_Port
mov al, 57h         ; Watch dog event flag.
out dx,al

mov dx, EC_Data_Port
mov al, 04h          ; Reset event.
out dx,al

mov dx, EC_Command_Port
mov al,28h          ; start WDT function.
out dx,al
exit
END
```

Appendix D

AMD G-Series

Advantech MIO-5270 is a MIO compact Single Board Computer with AMD G-series APU which supports AMD accelerated processing technology. This technology (known as ATI stream) is a software and hardware combination that enables CPU graphic engine acceleration. This acceleration can be supported with specific 3rd party applications.

Target List of Supported 3rd Party Applications:

- Adobe Flash Player 10.1
- ArcSoft SimHD Plug-in
- ArcSoft MediaConverter 4
- ArcSoft MediaConverter 7
- ArcSoft Total-Media Theatre 3
- ArcSoft Total-Media Theatre 4
- CyberLink MediaShow 5
- CyberLink MediaShow Espresso 5.5
- CyberLink MediaEspresso 6
- CyberLink PowerDVD 9
- CyberLink PowerDVD 10
- CuberLink PowerDirector 7
- CuberLink PowerDirector 8
- CyberLink PowerProducer 5
- MainConcept H.264/AVC Pro OpenCL Encoder
- Roxio Creator 2010
- Roxio Creator 2011

Appendix D AMD G-Series

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Please verify specifications before quoting. This guide is intended for reference purposes only.

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